TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY CONTROL PERMIT NO. 1000042

I. INTRODUCTION

This Class I (Title V or Part 70) Permit is for the operation of the Ray Complex Hayden Smelter (Hayden Smelter), located in Hayden, Gila County, Arizona. The Hayden Smelter is owned and operated by American Smelting and Refining Company (ASARCO). The facility produces 99% pure copper anodes and commercial grade (93% and 98%) sulfuric acid.

A. Company Information

Facility Name:	Ray Complex Hayden Smelter
Mailing Address:	P.O. Box 8
Facility Address:	640 ASARCO Avenue, Hayden, Gila County, AZ 85235

B. Attainment Classification

The facility is located in an attainment area for NOx, CO, Pb, and Ozone. The facility is located in a non-attainment area for PM-10 and SO_2.

II. PROCESS DESCRIPTION

Copper is produced from sulfide ore concentrates by pyrometallurgical smelting methods. The ore (typically containing less than 1% copper) is concentrated before being transported to the smelter. Concentrations of 35% copper are accomplished at the mine and milling site by crushing, grinding, and flotation. A conventional pyrometallurgical copper smelting process includes drying, smelting, converting, and fire refining. Final copper product is about 99% pure. The following paragraphs discuss the operations at the Hayden Smelter.

A. Unloading Operations

Copper concentrates, fluxes, by products, and coke are delivered to the smelter in rail cars and trucks. These incoming materials are apportioned into metallurgically appropriate flash furnace feed which is stored in the four outside storage bins. Feeds from the bins are screened. Oversized material is sent to the crusher for size reduction and then recycled back to the screens. The undersized material passes through a hammermill for delumping and stored in the 200-ton oxygen furnace wet feed bins.

B. Flash Furnace Building Operations

Wet feed from the bins is discharged into the natural gas fired fluid bed dryers. The dried feed is carried out with the exhaust gases from the top of the dryers as particulate and is collected by a product baghouse. The dried feed is then stored in the dry feed bins. Baghouse exhaust is directed to an electrostatic precipitator (ESP). This ESP also controls gas streams captured by the flash furnace slag and matte tapping hoods.

The dry feed is then fed into the Inco oxygen flash furnace where it is introduced into the burner with combustion oxygen. The molten flash furnace bath separates into a heavy matte layer and a lighter slag layer. The matte is tapped from the furnace and runs down ventilated launders into 17-20 ton ladles below the furnace floor. The filled ladles are then transported to the converter floor by rail. Slag is skimmed from the bath through a ventilated port and launder into a ladle and delivered to the slag cooling area.

C. Revert Crushing System

Reverts consist primarily of matte and slag shells with minor amounts of brick and silica flux. Shells form on the relatively cool surfaces of the pots used to transfer liquid metal and slag in the converter aisle. Reverts as large as 24 inches are charged to the system consisting of a primary jaw crusher and a screen. The revert crushing system is designed to crush reverts to a size less than 1 inch. The undersized material is transferred to storage. Oversize material is crushed in a secondary cone crusher before being sent to storage.

D. Converter Building

The converter building houses five converters and two anode furnaces. ASARCO also will install from time to time a spare anode furnace, though only two anode furnaces will be operating at a time. The converters receive matte (approximately 50 to 60 percent copper) from the oxygen furnace. An idle converter is heated and charged with molten matte. After charging is complete, oxygen enriched air is blown (slag blowing) through the converter which further reduces the sulfur content of the molten copper.

After the first slag blowing cycle, slag is skimmed from the bath and additional matte and some flux are added to the converter. This is followed by the second slag blowing cycle. Copper and reverts are added to regulate the temperature in the converters. Slag from the converters is returned to the flash furnace. The converter product is called blister copper. Blister copper is transferred to the anode furnaces by a bridge crane.

E. Anode Plant

The anode furnaces are charged with blister copper. The charge is oxidized by blowing air and is followed by slag skimming. The next operation, termed ‘poling’, involves introducing fuel (natural gas) into the anode furnace. The charge is then tapped into launders and poured into copper molds for shipment to the refinery.

F. Acid Plant

Gas from the converter primary hoods and flash furnace are first sent through the gas cleaning plant and then routed to a double contact acid plant designed to remove SO_2. The process consists of three steps:

1. Drying of the sulfur dioxide gas from the gas cleaning system;
2. Conversion of sulfur dioxide gas to sulfur trioxide gas; and
3. Absorption of the sulfur trioxide gas in sulfuric acid.

A product pump and cooler are provided to allow production of 93% or 98% acid which is pumped to eight storage tanks. Emissions from the acid plant are vented through the main stack center.

III. EMISSIONS

The Hayden Smelter is classified as a Class I, Major Source, pursuant to A.A.C. R18-2-101.61. The potential emission rates of the following pollutants are greater than 100 tons per year: (i) particulate matter, (ii) sulfur dioxide, and (iii) nitrogen oxides.

IV. COMPLIANCE HISTORY

A. Compliance Activities

In 1991, ADEQ requested ASARCO to conduct a study of input gases to R&R Cottrell and acid plant and provide to ADEQ a copy of this report.

In 1992, ADEQ ordered ASARCO to conduct performance tests on the R&R Flue and the Acid Plant Tailstack and a performance audit of the flow and SO2 CEMS on the R&R Flue and Acid Plant Tailstack.

In 1992 ADEQ was seeking response from ASARCO, requiring detailed testing for emissions, including Arsenic.

In 1992, ASARCO advised ADEQ that their preventive maintenance program in the converter area has been expanded as a result of many malfunctions in the converter area in 1991.

In 1992, ADEQ requested ASARCO to submit a revised plan for a fugitive emissions study.

Ambient air SO2 concentration monitoring network had failed numerous instrument audits. ADEQ requested maintenance procedures, derivation of monitor zero and description of software revisions.

In 1993, ADEQ advised ASARCO that it must be contacted prior to any demolition or renovation efforts involving removal of PCB containing transformers or RACM.

In 1995 the Secondary Hood Baghouse and Anode Gas Reformer projects were started to improve

stack opacity.

In 1996, ADEQ requested for information on processes and emissions calculation methodologies reported in emissions inventories.

In 1996, secondary hood baghouse and anode furnace opacity reduction projects were completed. ASARCO implemented its compliance plan and achieved final compliance at the reverts pile.

In 1997, the new wet gas handling system was under construction to replace the old dry gas handling system. Anticipate significantly improved efficiency. In the baghouse operations, polypropylene bag was selected over homopolymer acrylic bag for superior acid and wear resistance. Steam injection was used to control soot in anode furnaces.

In 1998, the reporting software was upgraded to the new Foxboro system.

B. Testing

The testing results from 1998 are summarized in Table 1, which demonstrate that the source is in compliance with the applicable standards.

Table 1. 1998 performance test results

Date	Source	Pollutant	Testing results	Standard	Reference methods
May 19-20	Acid plant	SO_2	239.99 ppm	650 ppm	Method 6
			230.15 lbs/hr	n/a	
May 22	Secondary hood flue	SO_2	1825.19 ppm	n/a	Method 6
			4326.15 lbs/hr	n/a	
June 2-4	Furnace vent	SO_2	118.11 ppm	n/a	Method 6
			159.60 lbs/hr	n/a	
Sept. 1	Acid plant	PM	0.0188 gr/dscf	n/a	Method 29
			21.8 lbs/hr	n/a	
Sept. 3	R&R Flue	PM	0.00286 gr/dscf	0.022 gr/dscf	Method 29
Sept. 10	Secondary baghouse	SO_2	1263.76 ppm	n/a	Method 6
			2816.95 lbs/hr	n/a	
Nov. 9-10	Acid plant	PM	0.0110 gr/dscf	n/a	Method 29
			10.8 lbs/hr	n/a	
Nov. 10-11	Acid plant	SO_2	433.41 ppm	650 ppm	Method 6

Date	Source	Pollutant	Testing results	Standard	Reference methods
			534.66 lbs/hr	n/a	
Nov. 11-12	Revert crusher	PM	0.007 gr/dscf	0.022 gr/dscf	Method 5
			1.992 lbs/hr	n/a	
Nov. 11-13	Secondary baghouse	SO_2	2066.9 ppm	n/a	Method 6
			5470.9 lbs/hr	n/a	
Nov. 13-16	Secondary baghouse	PM	0.00074 gr/dscf	n/a	Method 29
			1.73 lbs/hr	n/a	
Nov. 19	R&R Flue	PM	0.000626 gr/dscf	0.022 gr/dscf	Method 29
			1.95 lbs/hr	n/a	

V. APPLICABLE REGULATIONS

The Permittee has identified the applicable regulations that apply to each unit in its permit application. Table 2 summarizes the findings of the Department with respect to the regulations that apply to each emissions source. Installation Permit and other previous permit conditions are discussed under Section V of this technical review document.

Table 2. Applicable Regulations Verification

Unit ID	Date of Manufacture	Control Equipment	Applicable Regulations	Verification
Acid Plant - Main Stack Center Flash Furnace and Converter Primary Hoods	Flash Furnace - 1983 Converters - 1969	Gas cleaning plant, acid plant	40 CFR 60.163(a) 40 CFR 60.164(b) 40 CFR 60.165(a) 40 CFR 60.165(b)(2) 40 CFR 60.165(c) 40 CFR 60.165(d) A.A.C. R18-2-715.A 40 CFR 52.126 A.A.C. R18-2-715.D A.A.C. R18-2-715.F.2.a and b	The date of manufacture for the flash furnace is 1983, after the October 6, 1974 trigger date for NSPS. Since the gas streams are co-mingled, the NSPS applies since it is more stringent.
Main Stack Annulus Fluid bed dryers, flash furnace ventilation hoods, converter secondary vent gas hood emissions	Dryers - Flash furnace - 1983 Converters - 1969	Dryers and flash furnace ventilation hoods - baghouse, Converter secondary vent gas hood emissions - baghouse.	40 CFR 60.162 40 CFR 60.163(a) 40 CFR 60.164(a) A.A.C. R18-2-715.D A.A.C. R18-2-715.A 40 CFR 52.126	

Unit ID	Date of Manufacture	Control Equipment	Applicable Regulations	Verification
Anode Furnaces	1971 1959 (spare)	--	A.A.C. R18-2-715.A.2 A.A.C. R18-2-715.D A.A.C. R18-2-715.01.A 40 CFR 52.126	Dates of manufacture are 1959 (spare furnace) and 1971, which are prior to the trigger date (October 16, 1974) for NSPS.
Revert Crushing System	1980	Baghouse	A.A.C. R18-2-721.B.1.2 A.A.C. R18-2-721.D A.A.C. R18-2-702.B 40 CFR 52.126	The permit for the electric slag cleaning vessel and the revert crushing system incorrectly subject the source to 40 CFR 60, Subpart LL requirements. This is clearly not a metallic mineral processing plant as defined in the NSPS because it does not produce metallic mineral concentrates from the ore and is not located at the mill or the concentrator.
Electric Slag Cleaning Vessel (ESCV)	--	--	--	Decommissioned in January 1996.
Material Storage (Dry feed bins and dust bins)	1983	Baghouses	A.A.C. R18-2-715.A.2 A.A.C. R18-2-715.D 40 CFR 52.126	Subject to PM standards under A.A.C. R18-2-715 and 40 CFR 52.126.
Applicability of A.A.C. R18-2-715.F: Stacks Capable of Emitting Greater than or Equal to 5% of the Allowable Annual Sulfur Dioxide Emissions from the Smelter				
As identified the following are capable of emitting greater than or equal to 5% of the allowable annual sulfur dioxide emissions from the smelter: Main and Annulus stacks.			A.A.C. R18-2-715.A.2 A.A.C. R18-2-715.D A.A.C. R18-2-715.F.2.a A.A.C. R18-2-715.F.2.b A.A.C. R18-2-715.01.A through C A.A.C. R18-2-715.01.E through P	The permittee has identified these streams to be capable of emitting greater than or equal to 5% of the allowable annual sulfur dioxide emissions from the smelter.

VI. PREVIOUS PERMITS AND CONDITIONS

A. Previous Permits

Table 3. Previous permits

Permit Number	Date Issued	Application Basis
1166	September 13, 1982	Installation Permit
0308-85	April 9, 1984	Operating Permit
1215 [1]	April 4, 1989	Installation Permit

Permit Number	Date Issued	Application Basis
1240 [2]	August 7, 1992	Installation Permit
071162	February 11, 1993	Installation Permit for SVE-Voluntarily Terminated on November 19, 1996. No discussion of this permit is included in this document.
1000276	February 13, 1996	Minor Permit Revision
1000462	November 11, 1998	Minor Permit Revision

1. The electric slag cleaning vessel (ESCV) was decommissioned in January 1996 and in a meeting with ADEQ on February 23, 2000, ASARCO indicated that they had no intention to continue operating the device.
2. In a correspondence dated April 8, 1999, ASARCO states "the Chilito silica flux crushing facility project (Installation Permit #1240) was cancelled and never constructed. Installation permit conditions for Permit #1240 no longer apply."

B. Previous Permit Conditions

Table 4. Installation Permit 1166

Condition No.	Determination				Comments
	Revise	Keep	Delete	Streamline	
Att. A.1.a				T	This condition states the permittee shall meet the applicable particulate matter emissions standard. This condition is hereby streamlined as a part of this Title V permit renewal.
Att. A.1.b	T				This condition is hereby revised to require annual testing as part of this Title V permit renewal.
Att. A.2				T	This condition states the permittee shall meet the applicable opacity standard. This condition is hereby streamlined as a part of this Title V permit renewal.
Att. A.3.a and b.				T	This condition states the permittee shall meet the applicable sulfur dioxide standard. This condition is hereby streamlined as a part of this Title V permit renewal.
Att. A.4		T			This condition is hereby carried over as part of this Title V permit renewal.
Att. A.5	T				This condition is hereby revised to require quarterly auditing as part of this Title V permit renewal.
Att. A.6		T			This condition is hereby carried over as part of this Title V permit renewal.

Condition No.	Determination				Comments
	Revise	Keep	Delete	Streamline	
Att. A.7		T			This condition is hereby carried over as part of this Title V permit renewal.
Att. A.8			T		The permittee has complied with this requirement. This condition is hereby deleted as part of this Title V permit renewal.
Att. A.9			T		The permittee has complied with this requirement. This condition is hereby deleted as part of this Title V permit renewal.

Table 5: Operating Permit No. 0308-95

Condition No.	Determination				Comments
	Revise	Keep	Delete	Streamline	
Att. A.1				T	This condition states the permittee shall meet the applicable regulations. This condition is hereby streamlined as a part of this Title V permit renewal.
Att. A.2.A		T			This condition is hereby carried over as part of this Title V permit renewal.
Att. A.2.B		T			This condition is hereby carried over as part of this Title V permit renewal.
Att. A.2.C		T			The permittee is required to continue to calibrate, maintain, and operate an ambient air quality monitor for SO_2 according to SIP. This condition is hereby kept as part of this Title V permit renewal.
Att. A.2.D				T	This condition concernssulfur control equipment by-pass which is covered by A.A.C. R18-2-715.01.T. This condition is hereby streamlined as a part of this Title V permit renewal.
Att. A.3.A	T				This condition concerns reporting requirements when NAAQS have been exceeded, and is revised in this Title V permit renewal.
Att. A.3.B	T				This condition concerns reporting during breakdown or malfunction. This condition is hereby revised to incorporate R18-2-310 language as part of this Title V permit renewal.

Condition No.	Determination				Comments
	Revise	Keep	Delete	Streamline	
Att. A.3.C	T				This condition is hereby revised to incorporate R18-2-310 language as part of this Title V permit renewal.
Att. A.3.D	T				This condition is hereby revised to incorporate R18-2-310 language as part of this Title V permit renewal.
Att. A.4				T	This condition is hereby streamlined as part of this Title V renewal permit.
Att. A.5				T	This condition is hereby streamlined as part of this Title V renewal permit.
Att. A.6		T			This conditions required O&M plan for the CEMS. This condition is hereby carried over as part of the Title V permit renewal.
Att. A.7			T		This condition is related to the previous operating permit, which required the use of ambient monitoring data as part of supplemental control system (SCS). The SCS technology was prior to the double contact acid plant control. The use of SCS had been discontinued. This condition is hereby deleted.
Att. A.8	T				This condition concerns operation and maintenance of ambient monitors until April 1, 1987. Since SIP requires a 10-year maintenance plan, this condition is hereby kept and revised in this Title V permit renewal.
Att. A.9	T				This condition concerns mass testing for particulate matter (PM). In this Title V permit renewal, Permittee is required to conduct an annual PM testing.
Att. A.10				T	This condition concerns permit revocation. This condition is hereby streamlined as part of this Title V permit renewal.
Att. A.11				T	This condition concerns violations. This condition is hereby streamlined as part of this Title V permit renewal.

Table 6: Installation Permit No. 1215

Condition No.	Determination				Comments
	Revise	Keep	Delete	Stream-line	
Att. A.1				**T**	This condition states the permittee shall comply with all the applicable regulations. This condition is hereby streamlined as a part of this Title V permit renewal.
Att. A.2	**T**				This condition subjects the revert crushing system to requirements of 40 CFR 60, Subpart LL. This is clearly not a metallic mineral processing plant as defined in the NSPS because it does not produce metallic mineral concentrates from the ore and is not located at the mill or the concentrator. This condition was not imposed to avoid exceeding NAAQS or to avoid any applicable regulation. It was purely a misapplication of the rule. This condition is hereby revised as part of this Title V permit renewal.
Att. A.3		**T**			This condition states the particulate matter emissions shall be controlled by a baghouse with a rated efficiency of 99%. This efficiency was used as base data to demonstrate that the net emission increase is less than the significant PM level. This condition is hereby carried over as part of the Title V permit renewal.
Att. A.4	**T**				This condition subjects the revert crushing system to the PM and opacity requirements of 40 CFR 60, Subpart LL. This is clearly not a metallic mineral processing plant as defined in the NSPS because it does not produce metallic mineral concentrates from the ore and is not located at the mill or the concentrator. This condition was not imposed to avoid exceeding NAAQS or to avoid any applicable regulation. It was purely a misapplication of the rule. This condition is hereby revised as part of this Title V permit renewal.
Att. A.5		**T**			This condition is hereby carried over as part of this Title V permit renewal.
Att. A.6		**T**			This condition is hereby carried over as part of the Title V permit renewal.
Att. A.7		**T**			This condition is hereby carried over as part of the Title V permit renewal.

Condition No.	Determination				Comments
	Revise	Keep	Delete	Stream-line	
Att. A.8		T			This condition limits the material throughput throught the revert crusher system. This condition is hereby carried over as part of this Title V permit renewal.
Att. A.9				T	This condition is hereby streamlined as part of this Title V permit renewal.
Att. A.10			T		The ESCV malfunctioned in January 1996 and has since been decommissioned. This condition is hereby deleted as part of this Title V permit renewal.
Att. A.11			T		The ESCV malfunctioned in January 1996 and has since been decommissioned. This condition is hereby deleted as part of this Title V permit renewal.
Att. A.12			T		The ESCV malfunctioned in January 1996 and has since been decommissioned. This condition is hereby deleted as part of this Title V permit renewal.
Att. A.13			T		The ESCV malfunctioned in January 1996 and has since been decommissioned. This condition is hereby deleted as part of this Title V permit renewal.
Att. A.14			T		The permittee has complied with this condition. This condition is hereby deleted as part of this Title V permit renewal.
Att. A.15	T				This condition concerns recordkeeping and reporting requirments of Part 60, Subpart A. Since the revert system is not subject to NSPS and since the ESCV has been decommissioned this is not applicable. This condition is hereby revised as part of this Title V permit renewal.
Att. A.16			T		This condition is hereby deleted as part of this Title V permit renewal.
Att. A.17	T				This condition concerns O&M for process and pollution control equipment. This condition is hereby revised as part of this Title V permit renewal.
Att. A.18			T		This condition concerns cancellation of installation permit. This condition is hereby deleted as part of this Title V permit renewal.

Table 7: Minor Permit Revision No. 1000276

Condition No.	Determination				Comments
	Revise	Keep	Delete	Stream-line	
1.A				T	This condition states the PM limit for the anode steam boiler. This condition is hereby streamlined as a part of this Title V permit renewal.
1.B				T	This condition states the sulfur dioxide limit for the anode steam boiler. This condition is hereby streamlined as a part of this Title V permit renewal.
1.C				T	This condition limits the fuel to natural gas. This condition is hereby streamlined as a part of this Title V permit renewal.
1.D	T				This condition states the opacity limit. The opacity limit is 15%. The permit misapplied the opacity limit under R18-2-715.D. This condition is hereby revised as part of this Title V permit renewal.
1.E				T	This condition requires the permittee to maintain and operate the boiler according to the manufacturer's specifications. This condition is hereby streamlined as a part of this Title V permit renewal.

Table 8: Minor Permit Revision No. 1000462

Condition No.	Determination				Comments
	Revise	Keep	Delete	Stream-line	
1				T	This condition states the opacity of fugitive emissions at the smelter. This condition is hereby streamlined as a part of this Title V permit renewal.

VII. PERIODIC MONITORING

A. Plantwide Sulfur Dioxide Monitoring

Hayden Smelter is, plant-wide, subject to the sulfur dioxide multi-point rollback (MPR) rule set forth in A.A.C. R18-2-715.F.2. For purposes of determining compliance with the MPR rule, Permittee is required under A.A.C. R18-2-715.01(K), (K)(1) and (K)(2) to install, calibrate, maintain, and operate a measurement system for continuously monitoring sulfur dioxide concentrations and stack gas volumetric flow rates of the following:

1. gaseous stream at main flue of the five Pierce Smith converter secondary hoods;

2. vent gas of fugitive emissions captured by all the slag tapping hoods, matte tapping hood, and slag return hoods;
3. main gaseous stream to the inner one-thousand-foot stack.

The performance of the measurement systems is required to be demonstrated in accordance with 40 CFR 60, Appendix F.

In addition, Permittee is required to perform material balances for sulfur on a monthly basis to determine total overall emissions.

B. Combined Gas Stream of Dryers Flue and Furnace Vent Hoods

1. Opacity

The combined gas stream is subject to an opacity standard of no greater than 20%. The Permittee is required under 40 CFR 60.165(b)(1) to maintain and operate a continuous monitoring system for opacity. The monitoring system is required to meet the requirements of 40 CFR 60.13 and 40 CFR 60, Appendix B, Performance Specification 1.

2. Particulate Matter

Under common control of the R&R Cottrell ESPs, the combined stream is subject to a PM standard of 0.022 gr/dscf set forth in 40 CFR 60.162(a). Compliance test results indicate that the standard was able to be met. Please see the "Compliance History" section in this technical remarks document. This permit requires a stack test every year plus monitoring the flue opacity to fulfill the periodic monitoring requirements for particulate matter emissions. Although no data are available to precisely correlate opacity to particulate matter emissions, doing so would at least indicate potential problems with the air pollution control device. If corrective actions are taken to rectify the problems associated with the pollution control device, then compliance can be inferred on the basis that the source operates its pollution control equipment in a manner consistent with good air pollution control practices. A 24-hr rolling average opacity of 15% is established in the permit beyond which investigation of the control equipment needs to be initiated and possible corrective action implemented. Not making such investigation and possible corrective action could potentially hold the source in violation of the permit terms.

C. Converters Secondary Hoods Gas

1. Opacity

The gas stream is subject to an opacity standard of no greater than 20% set forth in A.A.C. R18-2-715.D. The Permittee is required under A.A.C. R18-2-306.A.3.b to install, maintain and operate a continuous monitoring system to perform periodic monitoring for opacity. The monitoring system is required to meet the requirements of 40 CFR 60, Appendix B, Performance Specification 1.

2. Particulate Matter

The secondary hood flue gas is subject to the particulate matter standard set forth in 40 CFR 52.126(b), the Federal Implementation Plant. A 24-hr rolling average opacity of 15% is established in the permit beyond which investigation of the control equipment needs to be initiated and possible corrective action implemented. Not making such investigation and possible corrective action could potentially hold the source in violation of the permit terms. Although no data are available to precisely correlate opacity to particulate matter emissions, doing so would at least indicate potential problems with the air pollution control device. If corrective actions are taken to rectify the problems associated with the pollution control device, then compliance can be inferred on the basis that the source operates its pollution control equipment in a manner consistent with good air pollution control practices.

D. Monsanto Acid Plant Tailgas

1. Opacity

The acid plant tailgas is subject to an opacity standard of no greater than 20% set forth in 40 CFR 60.164(b). The Permittee is required under A.A.C. R18-2-306.A.3.b to install, maintain and operate a continuous monitoring system to perform periodic monitoring for opacity. The monitoring system is required to meet the requirements of 40 CFR 60, Appendix B, Performance Specification 1.

2. Particulate Matter

The acid plant tailgas is subject to the particulate matter standard set forth in 40 CFR 52.126(b), the Federal Implementation Plant. A 24-hr rolling average opacity of 15% is established in the permit beyond which investigation of the control equipment needs to be initiated and possible corrective action implemented. Not making such investigation and possible corrective action could potentially hold the source in violation of the permit terms. Although no data are available to precisely correlate opacity to particulate matter emissions, doing so would at least indicate potential problems with the air pollution control device. If corrective actions are taken to rectify the problems associated with the pollution control device, then compliance can be inferred on the basis that the source operates its pollution control equipment in a manner consistent with good air pollution control practices.

3. Sulfur Dioxide

The acid plant tailgas is subject to the sulfur dioxide emission standard of 650 ppm set forth in 40 CFR 60.163(a). The Permittee is required to maintain and operate a SO_2 continuous monitoring system consistent with Subpart P requirements downstream of the Monsanto acid plant that will be utilized to monitor and record SO_2 emissions discharged into the atmosphere and determine compliance with the SO_2 emission standard. The SO_2 CEMS is required to meet the requirements of 40 CFR 60.13 and 40 CFR 60, Appendix F.

E. Material Storage Facilities

Opacity/Particulate Matter

The material storage facilities are subject to the 20% opacity standard set forth in A.A.C. R18-2-715.D and the particulate matter standard set forth in 40 CFR 52.126(b), the Federal Implementation Plan. Baseline values are to be established for opacity of each stack. The Permittee is required to make a biweekly survey of the visible emissions from all stacks against their baseline values, when the material feeding is in process.

If there are no visible emissions, the Permittee only needs to record and report the result as "no visible emissions". If the Permittee finds that on an instantaneous basis the visible emissions are in excess of the opacity baseline value, then he is required to make a six-minute Method 9 observation for the stack. If the observation indicates opacity in excess of the baseline value, then the Permittee is required to initiate necessary corrective action to reduce opacity to below the baseline value and record the source of emissions, date, time, and result of the observation, and the name of the observer. If this observation indicates opacity in excess of 20%, then the Permittee is also required to report it as excess emissions. Although no data are available to directly correlate the baseline value to particulate matter emissions, doing so would at least indicate potential problems with the relevant baghouse. If corrective actions are taken to rectify the problems associated with the baghouse, then compliance can be inferred on the basis that the source operates its pollution control equipment in a manner consistent with good air pollution control practices.

F. Revert Crushing Plant

1. Opacity

   The revert crushing plant fugitive emissions are subject to 10% opacity standard set forth through Installation Permit No. 1215. The Permittee is required to make a monthly survey of the visible emissions from the plant when it is in operation. If the Permittee finds that on an instantaneous basis the visible emissions are in excess of 10% opacity, then he is required to make a six-minute Method 9 observation. If this observation indicates opacity in excess of 10% then the Permittee is required to report it as excess emissions. If the Permittee finds that the visible emissions are less than 10% opacity, then the Permittee is required to record the source of emission, date, time, and result of the observation, and the name of the observer.

2. Particulate Matter

   The stack emission of the revert crushing plant is subject to a PM standard of 0.022 gr/dscf set forth in the Installation Permit No. 1215. Compliance test results indicate that the standard was able to be met. Please see the "Compliance History" section in this technical remarks document. A baseline value is to be established for the stack opacity. The Permittee is required to make a monthly survey of the stack emission against the baseline value. If the Permittee finds that on an instantaneous basis the stack emission is in excess of the baseline value, then he is required to make a six-minute Method 9 observation. If the observation indicates opacity in excess of the baseline value, then the Permittee is required to initiate

necessary corrective action to reduce opacity to below the baseline level and record the source of emission, date, time, and result of the observation, and the name of the observer. If this observation indicates opacity in excess of the 7% standard then the Permittee is also required to report it as excess emissions. Although no data are available to directly correlate the baseline value to particulate matter emissions, doing so would at least indicate potential problems with the revert plant baghouse. If corrective actions are taken to rectify the problems associated with the baghouse, then compliance can be inferred on the basis that the source operates its pollution control equipment in a manner consistent with good air pollution control practices.

G. Fossil-fuel Fired Industrial and Commercial Equipment

1. Opacity

Permittee is required to report all six-minute periods in which the opacity of any plume or effluent from any burners of this section exceeds 15 percent.

2. Particulate Matter

Permittee is required to keep on record the fuel firing rate and lower heating value of the fuel being fired. AP-42 factors with the records may be used to monitor and estimate the particulate matter emissions.

3. Sulfur Dioxide

Permittee is required to keep on record the heating value, density, and sulfur content for the diesel fuel being fired. AP-42 factors and records may be used to monitor and estimate the sulfur dioxide emissions.

H. Visible Fugitive Emissions from Process Sources

The visible fugitive emissions from process sources are subject to 40% opacity standard set forth in A.A.C. R18-2-702(B). The Permittee is required to make a biweekly survey of the visible emissions from the smelter when it is in operation. If the Permittee finds that on an instantaneous basis the visible emissions are in excess of 40% opacity, then he is required to make a six-minute Method 9 observation. If this observation indicates opacity in excess of 40% then the Permittee is required to report it as excess emissions. If the Permittee finds that the visible emissions are less than 40% opacity, then the Permittee is required to record the source of emission, date, time, and result of the observation, and the name of the observer.

I. Non-point Sources

The standards in Article 6 are applicable requirements for non-point sources. The following sources will be monitored:

1. Driveways, parking areas, vacant lots

2. Unused open areas
3. Open areas (Used, altered, repaired, etc.)
4. Construction of roadways
5. Material transportation
6. Material handling
7. Storage piles
8. Stacking and reclaiming machinery at storage piles

All of these areas must comply with the opacity limitation of 40%. The control measures for these sites include gravel for driveways(1) and native vegetation for unused open areas(2). Most of the other sources require control measures of dust suppressants and/or wetting agents(3-8). Material transportation and storage piles also include covering the material (5 and 7), while stacking and reclaiming includes minimizing fall distance (8). In case the instances of open burning occur, the condition in the permit directs ASARCO to obtain a permit from ADEQ, or the local officer in charge of issuing burn permits.

Monitoring and recordkeeping requirements for driveways (1) includes maintaining the gravel, and keeping a log of dates new gravel is added. Unused open areas (2) includes a monthly status of the areas and dates fresh vegetation was added. All other non-point sources (3-8) require a record of the date and type of activity performed, and the type of controls used. Also, monitoring requirements for the applicable open burning rule may be satisfied by keeping all open burn permits on file.

J. Other Periodic Activities

1. Abrasive Sand Blasting

   In case that abrasive sand blasting activities are conducted on-site, R18-2-726 and R18-2-702 (B) are applicable requirements, and as such have to be included in the permit. It was decided to prescribe minimal monitoring requirements for this activity.

2. Spray Painting

   In case that spray painting activities are conducted on-site, R18-2-727 and R18-2-702(B) are applicable requirements, and as such, have to be included in the permit. R18-2-727(A) and R18-2-727(B) are included in the approved State Implementation Plan (SIP). R18-2-727(c) and R18-2-727(D) are also a part of the approved SIP. They are present in the definitions section of the SIP as R9-3-101.117. EPA approved SIP provision R9-3-527.C is not present in the amended rule. However, R9-3-527.C is an applicable requirement, and is federally enforceable till the current State SIP is approved by the EPA. It was decided to prescribe minimal monitoring requirements for this activity.

3. Roadway and Site Cleaning Machinery

As a means of demonstrating compliance with the Article 8 requirements, the Permittee has been required to keep a record of all emissions related maintenance activities performed on Permittee's roadway and site cleaning machinery stationed at the facility as per manufacturer's specifications.

4. Asbestos Demolition/Renovation

   As a means of demonstrating compliance with the requirements for asbestos demolition/ renovation activities, the Permittee has been required to keep a record of all relevant paperwork on file. The relevant paperwork shall include but not be limited to the "NESHAP Notification for Renovation and Demolition Activities" form, and all supporting documents.

5. Nonvehicle Air Conditioner Maintenance and/or Services

   As a means of demonstrating compliance with the Title VI requirements, the Permittee has been required to keep a record of all relevant paperwork to the applicable requirements of 40 CFR 82 - Subpart F on file.

VIII. TESTING REQUIREMENTS

The testing methods, location and pollutants to be tested, and testing frequency are presented in the following table:

Sampling location	Pollutant	Reference Method	Testing Frequency
R&R Flue	PM	Method 1-5	Annual
Secondary Baghouse	PM	Method 1-5	Annual
Monsanto Acid Plant	PM	Method 1-5	Annual
Monsanto Acid Plant	SO_2	Method 6	Annual
Furnace Vent	SO_2 RATA	Appendix B, PS2	Annual
Furnace Vent	Flow RATA	Appendix B, PS6	Annual
Secondary Hood Vent	SO_2 RATA	Appendix B, PS2	Annual
Secondary Hood Vent	Flow RATA	Appendix B, PS6	Annual
Monsanto Acid Plant	SO_2 RATA	Appendix B, PS2	Annual
Monsanto Acid Plant	Flow RATA	Appendix B, PS6	Annual
Revert Crusher Baghouse	PM	Method 1-5	One time

IX. AMBIENT SULFUR DIOXIDE MONITORING

The Permittee is required under A.A.C. R18-2-715.02.E to operate, maintain, and calibrate an ambient monitoring network consisting of five continuous ambient sulfur dioxide monitors located at Hayden Jail, Hayden Junction, Globe Highway, Montgomery Ranch, and Garfield Avenue. This requirement is incorporated into the pending Hayden SO_2 SIP's ten-year maintenance plan to ensure the attainment status.

X. INSIGNIFICANT ACTIVITIES

The following activities have been deemed insignificant by the Department:

Table 9: Insignificant Activity List

S. No.	Activity	Determination	Justification
1	Non-commercial (in-house) experimental, analytical laboratory equipment which is bench scale in nature including quality control/quality assurance laboratories supporting an electric utility facility, and research and development laboratories.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
2	Small pilot scale research and development projects.	No	These will be evaluated on a case by case basis considering size, nature and amount of emissions, and duration of project. Appropriate permits will have to be obtained as required by the regulations
3	Housekeeping activities and associated products used for cleaning purposes, including collected spilled and accumulated materials at the source, including operation of fixed vacuum cleaning systems for such purposes.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.a
4	Air conditioning, cooling, heating or ventilation equipment not designed to remove air contaminants generated by or released from associated or other equipment.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.a
5	General office activities, such as paper shredding, copying, photographic activities, and blueprinting, but not to include incineration.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
6	Restroom facilities and associated cleanup operations and stacks or vents used to prevent the escape of sewer gasses through plumbing traps.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.a
7	Smoking rooms and areas.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j

S. No.	Activity	Determination	Justification
8	Use of consumer products, including hazardous substances as that term is defined in the Federal Hazardous Substances Act (15 U.S.C. 1261, et. seq.) where the product is used at a source in the same manner as normal consumer use.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
9	Vacuum cleaning systems where the system is used exclusively for industrial or commercial use.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
10	Building maintenance and janitorial activities.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.a
11	Batch mixers with rated capacity of 5 ft^3 or less.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.d
12	Internal combustion (IC) engine driven compressors, IC engine electrical generator sets and IC engine driven water pumps used only for emergency replacement or standby service.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.h
13	Water treatment or storage for boiler feed water.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
14	Water treatment or storage or cooling systems for process water.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
15	Chemical storage associated with water and wastewater treatment where the water is treated for consumption and/or use within the permitted facility (limited to chemicals not listed in 40 CFR 68.13, chemicals listed in 40 CFR 68.13 but not stored in quantities less than threshold levels, and not subject to any applicable regulation under the Act or the Arizona Revised Rules).	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
16	The collection, transmission, liquid treatment and solids treatment process and domestic type wastewater and sewage treatment works, or treatment facilities, including septic tank systems which treat only domestic type wastewater and sewage.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
17	Firefighting activities and training conducted at the source in preparation for firefighting.	No	Subject to A.A.C. R18-2-602
18	Open burning activities.	No	Subject to A.A.C. R18-2-602
19	Flares used to indicate danger	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
20	Chemical storage and process holding tanks(limited to chemicals not listed in 40 CFR 68.13, chemicals listed in 40 CFR 68.13 but not stored in quantities less than threshold levels, and not subject to any applicable regulation under the Act or the Arizona Revised Rules)	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j

S. No.	Activity	Determination	Justification
21	Storage and piping of natural gas or liquefied petroleum gas.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
22	Storage and piping of butane or propane.	No	Subject to regulations under A.A.C. R18-2-730
23	Gasoline storage tanks with capacity of 10,000 gallons or less.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.b
24	Diesel fuel storage tanks with capacity of 40,000 gallons or less.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.c
25	Petroleum product storage tanks containing lubricating oil, transformer oil, or used oil.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
26	Distribution and piping of diesel fuel, lubricating oil, used oil and transformer oil.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
27	Storage and handling of drums or other transportable containers where the containers are sealed during storage, and covered during loading and unloading (includes containers of RCRA waste and used oil).	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
28	Waste motor oil collection and recycling.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
29	Storage tanks of any size containing exclusively soaps, detergents, waxes, greases, aqueous caustic solutions, or aqueous salt solutions.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
30	Storage tanks of any size containing exclusively aqueous acid solutions.	No	Subject to A.A.C. R18-2-730
31	Landscaping and site housekeeping equipment.	No	Subject to Article 8 regulations
32	Fugitive emissions from landscaping activities.	No	Subject to Article 6 regulations
33	Use of pesticides, fumigants, and herbicides.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
34	Groundskeeping activities and products.	No	Subject to regulations under Article 6.
35	Shoveling ore to and from belt conveyors and transfer points as part of routine maintenance programs.	No	Subject to A.A.C. R18-2-606
36	Air lance operations	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
37	Mechanized or manual cleanup and haulage operations	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
38	Concentrate reclamation	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j

S. No.	Activity	Determination	Justification
39	Waste concrete handling	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
40	Railroad track maintenance.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
41	Potable wellfield maintenance	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
42	Drilling and well development	No	Subject to regulations under Article 6.
43	Demolition, renovation and salvage operations.	No	Subject to regulations under Article 6 and/or 40 CFR 61, Subpart M
44	Cleanup of ditches	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
45	Stormwater drainage control	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
46	Cleanout of water collection sumps	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
47	Cleanup of railcars	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
48	Cleanup of clogged chutes	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
49	Manual cleanup around conveyor belts and chutes.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
50	Activities associated with the construction, repair or maintenance of roads and other paved or open areas, including operation of street sweepers, vacuum trucks, spray trucks and other vehicles related to the control of fugitive emissions of such roads or other areas.	No	Subject to A.A.C. R18-2-605
51	Unpaved public and private roadways within a stationary source site boundary.	No	Subject to A.A.C. R18-2-605
52	Road and lot paving operations at commercial and industrial facilities.	No	Subject to A.A.C. R18-2-604
53	Sanding of streets and roads to abate traffic hazards caused by ice and snow.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
54	Street and parking lot striping.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
55	Fugitive dust emissions from the operation of passenger automobile, station wagon, pickup truck or van at a stationary source.	No	Subject to A.A.C. R18-2-604

S. No.	Activity	Determination	Justification
56	Small equipment operations such as bobcats and backhoes and other small earth moving activities used as part of facility cleanup and material haulage.	No	Subject to A.A.C. R18-2-604 and 804
57	Tailing dam maintenance.	No	Subject to regulations under Article 6.
58	Cafeterias, kitchens and other facilities used for preparing food or beverages primarily for consumption at the source.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
59	Equipment using water, water and soap or detergent or a suspension of abrasives in water for purposes of cleaning or finishing.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
60	Construction and disturbance of surface areas for purpose of land development.	No	Subject to A.A.C. R18-2-604
61	Activities at a source associated with the maintenance, repair or dismantlement of an emission unit installed at the source, including preparation for maintenance, repair or dismantlement and preparation for subsequent startup, including preparation of a shutdown vessel for entry, replacement of insulation, welding and cutting, and steam purging of a vessel prior to startup.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
62	Maintenance, repair or dismantlement of buildings, utility lines, pipelines, wells, and other structures that do not constitute an emission unit.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
63	Containers, reservoirs, or tanks used exclusively in dipping operations to coat objects with oils, waxes or greases.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
64	Activities directly used in the diagnosis and treatment of disease, injury or other medical condition.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
65	Manually operated equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sawing, surface grinding or turning and associated venting hoods.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.f
66	Individual sampling points, analyzers, and process instrumentation, whose operation may result in emissions.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
67	Individual equipment that is transportable or activities within a facility established for testing units prior to sale or for purposes of research.	No	Please see comment on S. No. 2.
68	Individual flanges, valves, pump seals, pressure relief valves and other individual components that have the potential for leaks.	No	Subject to A.A.C. R18-2-730

S. No.	Activity	Determination	Justification
69	Brazing, soldering or welding operations.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
70	Battery recharging areas.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
71	Aerosol can usage.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
72	Plastic pipe welding.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
73	Acetylene, butane and propane torches.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
74	Architectural painting and associated surface preparation for maintenance purposes at individual or commercial facilities.	No	Subject to A.A.C. R18-2-727
75	Steam vents, condenser vents and boiler blowdown	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
76	Equipment used exclusively for portable steam cleaning.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
77	Blast-cleaning equipment using a suspension of abrasive in water and any exhaust system or collector serving them exclusively.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
78	Surface impoundments such as ash ponds, cooling ponds, evaporation ponds, settling ponds and storm water ponds.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
79	Pump/motor oil resevoirs, such as gear box lubrication.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
80	Transformer vents.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
81	Lubrication system vents.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
82	Hydraulic system reservoirs.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
83	Adhesive use which is not related to production.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
84	Caulking operations that are not part of a production process.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
85	Electric motors.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
86	Cathodic protection systems.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j

S. No.	Activity	Determination	Justification
87	High voltage induced corona.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
88	Production of hot/chilled water for on-site use not related to any industrial application.	No	Subject to A.A.C. R18-2-724
89	Safety devices such as fire extinguishers.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
90	Soil gas sampling.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
91	Filter draining.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
92	General vehicle maintenance and servicing activities at the source.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
93	Station transformers.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
94	Circuit breakers.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
95	Generation unit gas vents.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
96	Storage cabinets for flammable products.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
97	Fugitive emissions from landfill operations.	No	Subject to A.A.C. R18-2-730
98	HVAC vents.	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
99	Oxygen plant vents	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
100	Sandblasting	No	Subject to A.A.C. R18-2-726
101	Welding	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
102	Steam Cleaning	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
103	Air Compressor Venting	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
104	Spray Painting	No	Subject to A.A.C. R18-2-727
105	Gas turbines and stationary reciprocating internal combustion engines of not more than 325 aggregate brake horsepower	No	Subject to A.A.C. R18-2-719.

S. No.	Activity	Determination	Justification
106	Gas turbines and stationary reciprocating internal combustion engines that are emergency or standby units.	Yes	Insignificant pursuant to A.A.C. r18-2-101.54.h
107	Each individual piece of fuel burning equipment, other than internal combustion engines, which is fired at a sustained rate of not more than 500,000 Btu/hr for any eight hour period.	No	As long as the aggregate firing rate of all such pieces of equipment is greater than 500,000 Btu/hr, they are subject to A.A.C. R18-2-724.
108	Fuel combustion emission units and direct combustion units designed and used for comfort heating purposes or hot water for personal hygiene.	No	As long as the aggregate firing rate of all such pieces of equipment is greater than 500,000 Btu/hr, they are subject to A.A.C. R18-2-724.
109	Water heaters, space heaters, and forges	No	As long as the aggregate firing rate of all these pieces of equipment is greater than 500,000 Btu/hr, they are subject to A.A.C. R18-2-724.
110	Four 1,221,045 gal. sulfuric acid tanks	No	Subject to A.A.C. R18-2-730
111	Four 790,565 gal. sulfuric acid tanks	No	Subject to A.A.C. R18-2-730
112	7900 gal. magnesium hydroxide tank	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
113	325 gal. liquefied petroleum gas tank	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j
114	Truck shop wash burners	Yes	Insignificant pursuant to A.A.C. R18-2-101.54.j